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THESIS

TRENDS IN THE SOCIOECONOMIC CHARACTERISTICS  
OF ENLISTED NAVY ACCESSIONS BETWEEN FISCAL  
YEARS 1974 AND 1979.

by

David William Luengen

11 Sep 1980

Thesis Advisor:

George Thomas

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Trends in the Socioeconomic Characteristics  
of Enlisted Navy Accessions Between Fiscal  
Years 1974 and 1979

by

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Lieutenant Commander, United States Navy  
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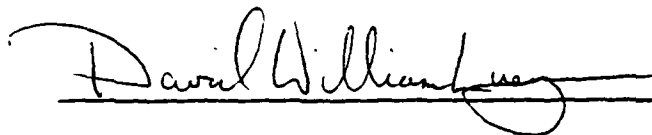
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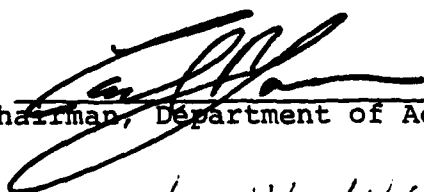
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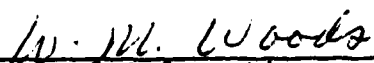


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## ABSTRACT

Socioeconomic representativeness is one of the major equity issues in manpower procurement. The relationship between the military and civilian society was a fundamental question of vital interest to the nation's founding fathers. This has continued to be a concern throughout the following years. Additionally, representativeness as it relates to equality of opportunity has become an increasing social concern.

This thesis examines the socioeconomic characteristics of Navy personnel who enlisted during the period between July 1, 1974, and September 30, 1979. The purpose was to determine if any trends in the socioeconomic characteristics were apparent during that period. The socioeconomic characteristics of the fiscal year 1977 Navy enlistees were compared to the U.S. population of 1977. This was done to determine the socioeconomic representativeness of the Navy's enlistees in that year.

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## I. INTRODUCTION

This study examines the socioeconomic characteristics of Navy personnel who enlisted during the period beginning July 1, 1974 and ending September 30, 1979. The purpose of this examination is to determine if there were any apparent trends in the socioeconomic characteristics of recruits during that period. Also, the characteristics of those people who enlisted in fiscal year (FY) 1977 were compared to the U.S. population of 1977 for socioeconomic representativeness.

Cooper in Military Manpower and the All Volunteer Force states that socioeconomic representativeness is one of the major equity issues in manpower procurement. Equality of opportunity is an increasing social concern. Additionally it would be undesirable to have the military composed of persons from only one region of the country or just one racial group. The precise definition of social representativeness is elusive at best. The relationship between the military and civilian society was a fundamental question of vital interest to the nation's founding fathers. This continued to be of concern throughout the following two centuries. As we begin the third century of the U.S. military, the question of who should staff the military remains as vital as ever.

Who should serve in the armed forces of the United States? This broad question results in several others being raised.

Some are quantitative and straightforward. How many people are needed? How high a pay scale will be necessary to attract and retain a sufficient number of personnel? What are the costs? Other questions are qualitative and more subtle. What levels of skill and ability are needed? How important is it for the military to be representative of the larger civilian society in terms of demographic characteristics, such as socioeconomic status and race? How important is it for the military to be ideologically representative, i.e., that their views of the military and its mission be similar to the views held by civilians? What is the role of the citizen-soldier in the modern military?<sup>1</sup> The answer to this last question, and relevant to some of the others, may be answered this way, "to ensure that civilian sensibilities are incorporated within the military?"<sup>2</sup>

In 1973 a major policy change was made in which volunteerism became the only form of U.S. military manpower procurement. Representativeness has continued to be a topic of discussion just as it had during the period of conscription. The discussion has aspects of both equity and responsibility based on the notion that it is every citizen's right and obligation to aid in the defense of his country. In an era of the

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<sup>1</sup> Bachman, J.G., Blair, J.D., Segal, D.R., The All-Volunteer Force, p. 5, University of Michigan Press, 1977

<sup>2</sup> Binkin, M., Kyriachopoulos, I., Youth or Experience? Manning the Modern Military, p. 45, The Brookings Institute, 1979

"cold war" and the policy of nuclear deterrents, actual combat is not always necessary to defend our nation. Defense of the country can be construed to mean supporting the national security affairs of the country through participation in military service. Additionally, military effectiveness enters the argument. "There is a clear relationship between socioeconomic backgrounds and soldierly performance."<sup>3</sup> Combat effectiveness, productivity, and low discipline rates show a positive correlation with socioeconomic variables particularly education.<sup>4</sup> This by no means indicates that being middle class will make an outstanding military, but it implies that all socioeconomic classes should participate in the military for the benefit of the nation. The experience of World War II with the mixing of the classes, and the Korean War with the mixing of the races, gave less advantaged youth an opportunity to test themselves against more privileged youth. The policy of social representativeness is vitally important to an American Military.

The purpose of this study was twofold. First was the study of the socioeconomic characteristics of Navy enlistees over a 6 year period to determine if any trends existed.

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<sup>3</sup> Moskos, G.C. Jr., "National Service and the All-Volunteer Force," p. 5, A Statement to Military Personnel Subcommittee of the House Armed Services Committee, Washington, D.C., 14 February, 1979.

<sup>4</sup> Ibid.

Second was a comparison between the civilian society in 1977 to the Navy's accessions in FY 77 to test for social representativeness.

The history of social representativeness in the U.S. military is discussed in chapter II. Chapter III describes the data and variables used in this study. Also in this chapter is a description of the methodology used to process the data.

Chapter IV reports trends in the socioeconomic characteristics of Navy recruits between FY 74 and FY 79. The socioeconomic characteristics studied include geographic region, race, sex, education, mental aptitude, family income, age, marital status, and prior military service. This was done to determine if the composition of those volunteering for naval service had changed over the six years studied.

The social representativeness of the FY 77 Navy enlistees was examined in chapter V. The variables used to make the comparison to civilian society were geographic region, race, sex, education, and family income. The issue of social representativeness is a topic of current interest to the nation's lawmakers. Moskos, in his statement of February 14, 1979, to the Military Personnel Subcommittee of the House Armed Service Committee, discussed representativeness. He stated that the make up of those serving does not need to be perfectly calibrated to the social composition of the larger society. However, he asked the question, what kind of society excuses its privileged from serving in the ranks of its military?

The study revealed a number of interesting trends. The first trend that emerged was that an increasing percentage of Navy enlistees are Southerners. As expected, the Navy is also recruiting an increasing percentage of women. Additionally, the Navy is recruiting more nonwhites that it used to recruit. In terms of quality, the percentage of recruits that are high school graduates and who are in the upper fifty percentile based on the Armed Forces Qualification Test (AFQT), increased. The family incomes of white accessions are greater than those of nonwhites, however, the affluence of nonwhite recruits' families increased over the period. Also, the family income of female recruits was greater than that of the male recruits. The average age of the Navy's recruits increased over the period by about nine months of age. Lastly, the percentage of prior service recruits is increased from FY 74 to FY 79.

In terms of representativeness, the comparison revealed that the South was under represented in the Navy. The aggregate composition of the Navy by white and nonwhite racial groups is representative of the U.S. population. Racial composition by region for whites is representative. The nonwhites, however are not representative in terms of region of residence. Compared to the rest of society, the Navy recruits from the South and the West are under represented and the Northeast and North Central are over representative. In terms of sex, the percentage of males in the Navy is representative of society, however the percentage of females is not representative.

Educational level of recruits, measured by the percentage of high school graduates in the enlistment cohort, is higher in the Navy than in the civilian society. However, the percentage of nonwhite high school graduates in the Navy was smaller than in the U.S. population. Family income of white recruits was comparable to the U.S. population, but nonwhite enlistees come from families with much higher family income than the median family income in the nonwhite civilian population.



## II. HISTORY OF REPRESENTATIVENESS

### A. REVOLUTIONARY WAR

Representativeness in the U.S. military has been a long standing tradition modeled in the Anglo-Saxon concept, under which every free man between the ages of sixteen and sixty was obligated to respond, fully equipped, to any call to arms. Prior to the Revolution, the colonies' military consisted of local militia units. Citizens of a town could serve together with their friends and neighbors in military companies. These local companies would be formed into area or regional militia. This concept of the citizen militia - the idea that to be a citizen was to have the right and obligation to bear arms in the defense of the nation, was to become the future standard of American military tradition. Based on this policy there would not be the military class that existed in the European countries, however, each citizen was to share in the defense of his nation. Washington's view presented the prevailing opinion two hundred years ago:

It may be laid down as a primary position, and the basis of our system that every Citizen who enjoys the protection of a free government owes not only a pre-portion of his property, but even of his personal services to the defense of it.

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<sup>5</sup> Cooper, R.V.L., Military Manpower and the All-Volunteer Force, p. 47, 1977.

Based on this principle, the Continental Army was formed by consolidating colonial militias. Because the Continental Congress had no power to raise an army, it was at the mercy of the individual colonies to fill its manpower needs. The Colonies then called up militia and volunteers to fill these requests. At times when cash bonuses and free land in the West after the war did not attract sufficient numbers of men, some colonies enacted "draft" legislation to fill their units.

Following the Revolution, President Washington suggested military training for all nineteen year old males. They would be required to train for several weeks each summer for three years. He felt this system would be beneficial to the country because trained men would be ready to supplement the regular Army, if the need arose. The first Secretary of War, Henry Knox, later submitted a plan that would reorganize the militia under federal control to augment the existing seven hundred man U.S. Army. Both plans combined the idea of a citizen's right to bear arms and the concept of universal services. However, neither of these plans were approved by the Congress for implementation. "This idea of universal service was accepted in theory but was never implemented." The states were against universal service and a large standing army or a reserve militia controlled by the Federal government as possible interference in individual state's rights.

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<sup>6</sup> Ibid., p. 48.

Additionally, the cost of maintaining a force of this type was considered enormous. The dominant view was that standing armies in peace were not in keeping with the republican form of government. For these reasons, the states would provide the necessary manpower in the form of their militias when it was needed.

#### B. CIVIL WAR

The outbreak of the Civil War saw large armies raised by both the North and the South. Existing regular army troops, militia units and new recruits rapidly filled the ranks of both armies. As the war continued and numbers of enthusiastic volunteers diminished, both sides turned to new methods to raise additional manpower. The Confederacy was the first to turn to conscription, after only one year of the War. One of the driving forces in this decision was to keep the men already under arms from going home at the end of their one year enlistments.

The Federal government, facing the same reduction in the number of volunteers, enacted the Militia Act in 1862. It required states to furnish men through enlistments or draft if necessary. This system proved to be too unweildy for the states to control effectively so it was replaced on March 3, 1863 by the Enrollment Act. Under this act, the country's first draft law, all men between the ages of twenty and forty-five were required to register with the draft. A national quota was established which was equal to the number of men needed by the army. This quota was then divided according to each states' population and then subdivided by Congressional districts. Each district was permitted to

reduce its quota by the number of volunteers it had enlisted. There was no classification of registrants and any able-bodied man, selected by lottery, was drafted. The law also permitted a man to purchase an exemption for three hundred dollars or hire a substitute to take his place. This system was administered in Washington, D.C. and through federal regional offices, with no involvement by state and local governments.

This law changed the nature of military service in the U.S. in at least three ways. First, prior to this law, the American military tradition had not compelled a man to fight against his will. Second, American men were accustomed to fighting alongside their neighbors and friends, and being commanded by them, the draft forced them into regular army units or out-of-state militias. Third, the power to conscript and raise armies changed from the states to the federal government's control.

The Enrollment Act had been described as ill-conceived and unjust. By far the most discriminatory aspect of this law was the provision enabling the purchase of an exemption or the hiring of a substitute. The drafting of a substitute permanently exempted his sponsor, even if the substitute died or deserted the next day. Rich men easily bought their way out of the army. Wealthy districts filled their draft quotas from poor districts, offering huge bonuses to poor men who would serve for them. Under this system some men became wealthy as professional substitutes, by collecting the bounty

for one man, deserting and doing the same again elsewhere. The obvious injustice was dramatically emphasized when citizens and draft officials clashed in July 1863 in what was later known as the Draft Riots of New York. For four days an anti-draft mob controlled much of New York City, burning and looting anti-slavery and black property. "Loss of life has been estimated as high as 1000 persons, and property damage may have reached two million dollars."<sup>7</sup> In 1864 the law was amended so that only conscientious objectors could purchase exemptions.

The Confederate draft was an even greater fiasco. Unlike the Union law, whole classes of citizens were exempted. Conscientious objectors, railway employees, minor government officials, newspapermen, lawyers, school teachers, druggists, and others were exempted. In addition to these blanket exemptions, the Confederacy also permitted the hiring of a substitute, the price to be agreed upon between the individuals concerned. As the price skyrocketed, it was possible for recruits to be earning more money than their commanding officers.

The end of the Civil War ended America's first experience with conscription. The regular army and the states' militia continued to be the U.S. standing and reserve military forces.

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<sup>7</sup> Liston, R., Greeting: You are Hereby Ordered for Induction. . ., p. 29, McGraw Hill, 1970.

During the Civil War, only 46,347 men were actually drafted into Union military service, about 2.3 percent of the total military manpower raised by the North. The concept of the citizen-soldier was put into practice.

#### C. WORLD WAR I

Brigadier General Oakes, Assistant Provost Marshall of Illinois during the Civil War, wrote an exhaustive critique of the operation of the draft. When the U.S. next needed to raise large numbers of men for the military for World War I, his study was used to avoid the mistakes of the Civil War experience. The principles of the Oakes report were embodied in the Selective Service Act of 1917.

The act established the machinery to conduct the draft. Over 4600 local and 160 district boards were established composed of entirely of civilians. These boards were responsible for the registering of men, their classification for service, conducting physical exams, induction and shipment of them to military posts for training. There were five categories into which men, ages 21 to 30, were classified based on their value to the civilian sector. Those men with the most valuable skills in the civilian sector were categorized as Class V, those with the least value were put in Class I. "This, of course, led to an overrepresentation of the poor and black, as illustrated by the fact that blacks constituted 9.6 percent of all registrants but accounted for 13 percent of the

inductions."<sup>8</sup> The only blanket exemption under this law was given to 100,000 shipyard workers needed to expand the nation's merchant fleet. This discrimination resulted in some grumbling, but overall there were relatively few complaints about fairness.

Enactment of the law also made conscription the only basis for enlisted manpower procurement, since enlistments were halted so as not to disturb the orderly working of the Selective Service system. This element of the law invoked debate over the autocratic nature of conscription. It was likened to involuntary servitude since draftees were required to serve for the duration of the war, not a specific periods of time. Some felt that volunteerism had not been given a proper chance and that the law was an insult to American manhood. It was argued in Congress, that if proper cash inducements were made, sufficient numbers of young men would enlist for the duration of the war out of practical and patriotic considerations.

Nevertheless, the whole operation of drafting an army for World War I went smoothly. Perhaps much of this success can be attributed to General Oakes' report which had served as the basis for the drafting of the Selective Service Act. Of his recommendations incorporated into the 1917 Act, the most important was:

"We must depend in every time of national peril not on a standing army nor yet upon a reserve army, but upon a citizenry trained and accustomed to arms. . . a system by which every citizen who will volunteer for the training may be made familiar with the use of modern arms."<sup>9</sup>

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<sup>8</sup> Cooper, Op. Cit., p. 51.

<sup>9</sup> Ibid., p. 50.

Again, the citizen-soldier concept emerges as theoretical policy in America. However, for the first time, volunteerism was considered not practical in meeting military manpower requirements. At the war's end, the draft was stopped, and again military manpower needs were met with volunteers.

#### D. WORLD WAR II

The next crisis requiring a large military force was World War II. Again, Selective Service was enacted in 1940 to meet the needs of the military. Contrary to the practice of World War I, conscription was used to supplement volunteer enlistments. As before, the basic element of the system was the local draft board. Due to the increasing mechanization of the war, and the required industrial production to provide the war materials, the Selective Service did double duty. It supplied the men needed by the Armed Forces, and it also maintained the supply of manpower and skills needed for the war effort at home. Although the various deferments under this system kept the vital war machine working at home, those who served in the military might well argue that they gave a greater sacrifice for the war effort. On October 31, 1946, the draft was ended, with the Selective Service having provided 66 percent of all the men who served in uniform.

#### E. POST WORLD WAR II

In 1948, with the U.S. military commitments increasing and the size of the military declining, President Truman requested Congress to reinstitute the draft for the second



time in the history of the U.S. during a time of peace (the first was just prior to World War II in 1940). The universal Military Training and Service Act of 1951, 1959, 1963, and 1967 (although the title was changed in 1967) continued the practice of conscription.

With each new enactment of the law, the Selective Service's role was changed. Additional deferments were granted to students and various occupations. The Selective Service System became a manpower agency, charged not only with seeing that the nation had enough soldiers, but also enough doctors, scientists, engineers, technician, bricklayers, plumbers, and men with every other occupation skill. This process of "channeling" men into needed occupations and professional skills was accomplished through deferments from military service. These policies greatly broadened the scope of the draft and greatly altered its scope.

"The Director (General Hershey) has pointed out that one reason the Nation's shortage of scientists, engineers, and technicians in the late 1950's was not 40,000 to 50,000 greater was the systems student deferment policies of earlier years, particularly during the Korean War."<sup>10</sup>

As Davis and Dolbearne have commented, "At no time has the practice of conscription in this country been anything but selective."<sup>11</sup> There have always been exceptions and deferments

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<sup>10</sup> Liston, Op. Cit., p. 54.

<sup>11</sup> Davis, J.W. Jr. and Dolbearne, K.M., Little Groups of Neighbors, p. 21, Markham, 1968.

for men in some occupations or officials whose services are deemed more valuable at home. This is discriminatory in nature, in that by virtue of economic and social position exemptions from military service are obtainable to some. Clearly a college deferment for a black man was much less likely than that for a white man in the 1950's and early 1960's.

One of the major tenets upon which our nation was founded was the nation of an individual's freedom to choose his own destiny. This logically includes the right of individuals to choose their own occupations, without government interference or influence. The "channeling" policies of the Selective Service discriminated against the educationally disadvantaged by limiting or removing his freedom of choice.

The reestablishment of a military comprised of volunteer is a reaffirmation of individual rights. By making the military a sufficiently attractive occupation to enlist enough volunteers to meet military needs, the military's purpose is served with no loss of personal liberty. Additionally all qualified male citizens are afforded the option of exercising their rights and obligations to bear arms in the defense of the nation.

On a smaller scale the same opportunity is now being offered to women. Beginning with World War II, when women were first given full military status, they have been an important part of the military. In 1967, the restrictions

limiting their numbers to two percent of the military were removed. Military women increased from 1.9 percent to five percent of the total military between 1972 and 1976.<sup>12</sup> Annual growth of female strength is expected to continue through FY 82, at which time women will constitute about seven percent of the armed forces or 147,000 women.<sup>13</sup> Thus women can increasingly exercise their right and obligation to defend their nation.

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<sup>12</sup> Binkin, M. and Bach, S.J. Women and the Military, p. 14, The Brookings Institute, 1977.

<sup>13</sup> Ibid., p.2.

### III. METHODOLOGY

#### A. DATA BASE

The data regarding the Navy accessions were obtained from the Defense Manpower Data Center (DMDC), Monterey, California, cohort file. DMDC supports the Office of the Secretary of Defense (OSD) by maintaining and storing manpower data files. They respond to requests for data and analysis reports from OSD and other executive branch agencies or legislative branch agencies requested via OSD.

The file of Navy enlisted personnel contains approximately 85 elements of personal data for each enlistee. For purposes of this study, only ten elements were used. An additional variable, family income, obtained from another DMDC data file was also used. The data files were combined to form a new data file based on the fiscal year (FY) of accession for each enlistee. Until 1977 the fiscal year began on July first, but since then the beginning of the fiscal year was changed to October first. For that reason, the FY 77 data has a larger population, since the data were collected over a fifteen month period. The population of each entering cohort is as follows: (FY 74) 96,965, (FY 75) 106,692, (FY 76) 92,665, (FY 77) 124,090, (FY 78) 70,897, and (FY 79) 68,845.

The variables used for this study are as follows: home state, age, educational level, sex, race, ethnic group,

marital status, mental aptitude, previous military service, ZIP code, and family income. These data are at the time of the individual's enlistment. To further define some of the variables, educational level is the highest grade completed and mental aptitude is as classified by the Armed Forces Qualification Test (AFQT). Family income is the median family income in 1978 by ZIP code area of the enlistee.

The data for comparison of the Navy file to the U.S. population were obtained from the March 1978 Current Population Survey (CPS) by the Bureau of the Census. The CPS estimates are based on a sample of 57,215 households, therefore due to sampling error the CPS estimate may not exactly correspond to the figures that would be obtained if a complete census had been taken.

Another type of error in all surveys is non-sampling variability. It can be attributed to many sources and may include the inability to interpret the question, unwillingness on the part of the respondents to provide the information correctly or in its entirety, or the inability to recall the information. Another cause of this type of error results from errors in transcribing, recording, coding, and processing the data. Both the Navy and CPS data are subject to non-sampling variability.

## B. DATA MANIPULATION

The data in the cohort file were coded for use with the Statistical Package for the Social Sciences (SPSS). SPSS is an integrated system of computer programs designed for the analysis of social science data. In addition to the usual descriptive statistics, simple frequency distributions, and crosstabulations, SPSS contains procedures for selecting variables and recoding variables.

The crosstabulation is a joint frequency distribution of cases according to two or more classification variables. It is used to investigate the relationship between the classification variables. A subprogram, breakdown, provides a simple technique for examining the means and variances of a criterion or dependent variable among various subgroups in a sample or total population. In many respects this procedure is analogous to cross tabulation. Given a numeric dependent variable, which may be either continuous or discrete, for which a mean is a reasonable measure of central tendency, breakdown will enable the obtaining of a mean, standard deviation, and variances of the variable for classifications involving from one to five independent variables. These procedures were used to process the data for this study.

Some of the variables were recategorized (recoded) into larger sets for aid in interpretation and presentation of the results. The recoding also created sets that conform to Census Bureau groupings so that comparisons could be made.

Home state, the enlistee's home record at time of entry, was recoded to create a new variable, census region. The four census regions are Northeast, North Central, South, and West. The census regions are composed of the following states:

Northeast	-- Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania
North Central	-- Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas
South	-- Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas
West	-- Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, Hawaii

This allows Navy data to be compared to census data by regions.

The variable, race, was originally divided into three groups, white, black, and other. The "other" category includes Oriental and Polynesian races. Since the "other" category and black both represent minority races in the United States, race was recorded into white and nonwhite categories. This recoding also created majority and minority groups.

Educational level is in terms of the highest year of education completed. This was recoded in two ways. The

first method was to classify this variable into broad groups of education as follows: (1) elementary, up to and including, eight grade, (2) some high school, from ninth to eleventh grade and GED equivalent, (3) high school graduate, finished twelfth grade, (4) some college, finished freshman to junior year, and (5) college graduate, baccalaureate degree or higher. The second method was to classify the variable into high school graduates and non-high school graduates. High school graduates are those who completed the twelfth grade and received a diploma and those who attended or graduated from college. Non-high school graduates are those who did not complete high school but may have a GED equivalency certificate. The classification of the GED equivalency certificate is a reflection of Navy policy in this matter.<sup>14</sup>

The mental aptitude variable is the enlistee's mental group classification based on his score on the Armed Forces Qualification Test (AFQT) percentile. The highest classification is I and the lowest is V. A mental group is based on AFQT percentiles. The mental groups and the AFQT percentile ranges they represent are as follows:

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<sup>14</sup> Lockman, R.F., "Success Chances of Recruits Entering the Navy (SCREEN)," pp. C1-C2, Center for Naval Analyses, 1977.



Mental Group	AFQT Percentiles
I	99-93
II	92-65
IIIA	64-50
IIIB	49-31
IVA	30-21
IVB	20-16
IVC	15-10
V	9-1

This variable was recoded into two groups, I through IIIa and IIb through V, the upper and lower halves of the AFQT percentiles.

The forming of the two categories of the educational level and mental aptitude variables was done to determine how many enlistees were nominally eligible for technical or specialized training. Four categories of enlistees A, B, C, and D are determined by a combination of mental aptitude and educational level. Groups are determined as shown in the following matrix:

	<u>High School Graduates</u>	<u>Non High School Graduates</u>
Mental Groups I-IIIa	A	B
Mental Groups IIb-V	C	D

Those in groups A and B are reported as eligible for additional training beyond recruit training. GED equivalency certificates are treated as non high school graduates in the matrix and in Navy policy.<sup>15</sup>

The variable, family income, ranges in values from less than \$2000 to greater than \$50,000, with one value for each of the 10,708 ZIP codes. Because SPSS can not process this many values for one variable, family income was recoded into 21 groups. The coded values and the range of family income they represent are as follows:

CODED VALUE	RANGE OF INCOME IN DOLLARS
1	1--1999
2	2000--2999
3	3000--3999
4	4000--4999
5	5000--5999
6	6000--6999
7	7000--7999
8	8000--8999
9	9000--9999
10	10000--10999
11	11000--11999
12	12000--12999
13	13000--13999
14	14000--14999
15	15000--15999
16	16000--16999
17	17000--17999
18	18000--19999
19	20000--24999
20	25000--49999
21	50000 and above

This recoding is the same ranges of values used in the CPS

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<sup>15</sup>Ibid., p. 32.

grouping of family incomes. The recoded values of the variable then represents the class mark or mid-point value of range or interval it represents. For example, the value 17 represents all family incomes within the range from \$17,000 to \$17,999. The class mark or mid-point of the interval would be \$17,499.50 or \$17,500. Therefore the coded value 17 is equal to \$17,500. The same argument applies to all recoded values. By summing the products of the coded values and the number of cases within that respective interval and dividing this sum by the sample population a weighted average value is obtained. This methodology was used to calculate the mean value of the family income variable.<sup>16</sup>

The methods and recoding of data described in this chapter were used to generate the tables, figures and other data presented in Chapters IV and V.

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<sup>16</sup> Hoel, P.G. and Jessen, R.J., Basic Statistics for Business and Economics, pp. 14-15, Wiley, 1977.

#### IV. SOCIOECONOMIC TRENDS

Using the SPSS sub-programs described in Chapter III, it was possible to process the cohort data of each year for the analysis of socioeconomic characteristics of Navy enlistees. By comparing the data for each year against the other years, changes and trends in the variables studied were identified. Unless otherwise indicated, Navy enlisted accessions of all types and sources are included in the data.

##### A. GEOGRAPHIC

The first socioeconomic characteristic studied was home area, to determine the geographic representativeness of Navy enlistees. As described in Chapter III, the states were grouped into four regions corresponding with the Census Bureau Regions. The percentage of enlistees from each region for each year is shown in Figure I.

The South and Northeast both increased in the percentage of Navy enlistees they produced. The most dramatic change was the percentage of enlistees originating from the South, from FY 74 to FY 79. FY 74 compared to FY 79 indicates a 13.9 percent and 11.6 percent increase for the South and Northeast respectively. The North Central region had the largest decline (28.9 percent to 24.9 percent), a 14.5 percent change. The West decreased 11.4 percent from FY 74 to FY 79.

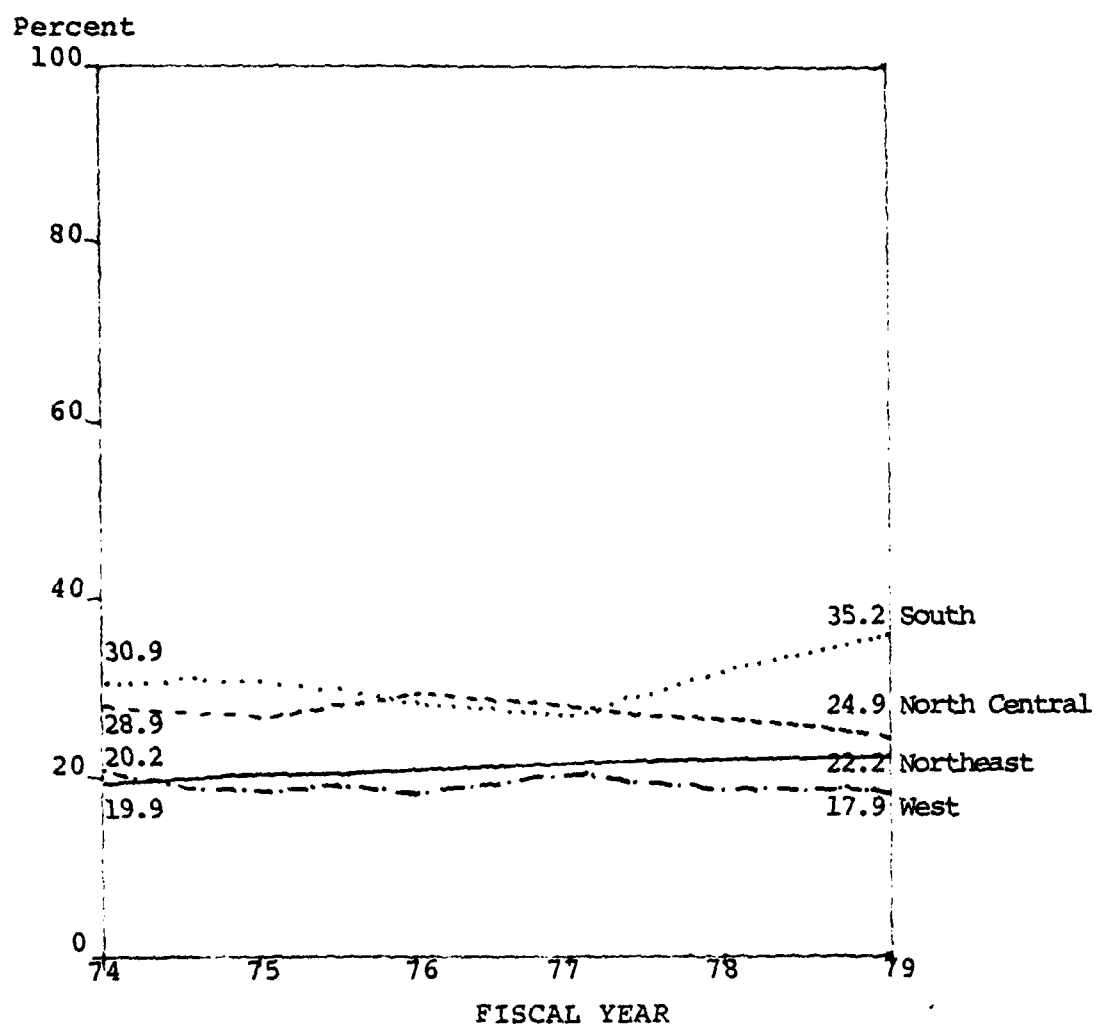


FIGURE 1. NAVY ACCESSIONS BY REGION IN PERCENT

## B. RACE

Next, the racial composition of the enlistees was determined for each year. The two groups were Caucasians and all other races. This was done to place all minority races into one category to determine their representation in the Navy. Figure 2 shows the percentage of nonwhite Navy recruits by year. From 12.1 in FY 74 to 17.7 in FY 79, there was a 41.3 percent increase in nonwhites entering the Navy. The only years which did not show an increase were FY 75 and FY 76.

To further explore the racial composition and regional representation, the percentage of recruits of each racial group from each region was computed. These figures are shown in Table I.

TABLE I

Percentage of Navy Accessions by Race, by Region, FY74 to FY79

REGION	RACE	FY74	FY75	FY76	FY77	FY78	FY79
Northeast	White	89.5	88.9	90.5	88.0	86.7	84.6
	Nonwhite	10.5	11.1	9.5	12.0	13.3	15.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0
North Central	White	91.2	91.7	91.9	88.2	89.5	88.9
	Nonwhite	8.8	8.3	8.1	11.8	10.5	11.1
	Total	100.0	100.0	100.0	100.0	100.0	100.0
South	White	80.6	82.5	84.3	81.1	79.3	74.3
	Nonwhite	19.4	17.5	15.7	18.9	20.7	25.7
	Total	100.0	100.0	100.0	100.0	100.0	100.0
West	White	92.7	92.0	91.4	87.1	87.9	86.1
	Nonwhite	7.3	8.0	8.6	12.9	12.1	13.9
	Total	100.0	100.0	100.0	100.0	100.0	100.0

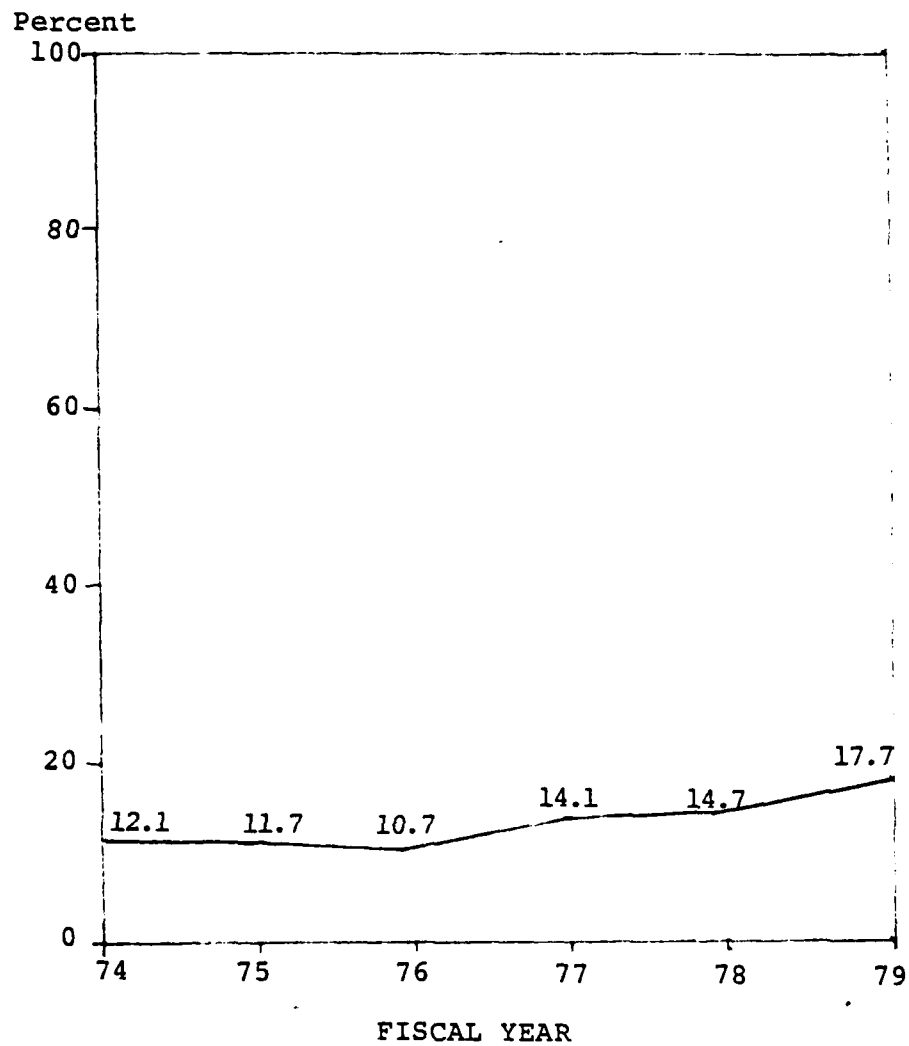


FIGURE 2. NONWHITE NAVY ACCESSIONS IN PERCENT OF ALL NAVY ACCESSIONS

Furthermore, the trend over the period was an increase in the nonwhite recruits, as a percentage of all recruits from that region, for all regions. This is not that surprising, considering the increase in the percentage of nonwhites entering over the period. The most dramatic increase occurred in the West, which had a 90.4 percent increase over the period. The percentage of white enlistees entering the Navy from the South decreased the most, 7.9 percent, over the period.

Table II shows the percentage of both racial groups that came from each region over the period. This revealed some interesting facts. The first being that about one-half of the nonwhite recruits are from the South. Enlistments of both racial groups increased over the period from the Northeast and the South. The largest change was a decrease of 25.8 percent of the nonwhites enlisting from the North Central region.

TABLE II

Percentage of Navy Accessions by Region, by Race, FY74 to FY79

Region	FY74	FY75	FY76	FY77	FY78	FY79
<u>White</u>						
Northeast	20.3	21.8	22.1	23.3	23.1	22.8
North Central	30.0	28.9	31.2	28.7	28.2	26.7
South	28.4	28.8	27.3	27.8	29.5	31.8
West	21.3	20.5	19.4	20.2	19.1	18.7
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
<u>Nonwhite</u>						
Northeast	17.3	20.5	19.4	19.1	20.6	19.4
North Central	20.9	19.8	22.8	23.4	19.3	15.5
South	49.6	46.3	42.5	39.3	44.7	51.0
West	12.2	13.4	15.2	18.2	15.3	14.1
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>



### C. SEX

In order to meet the Navy's goal of 45,000 enlisted women on active duty by FY 85, increasing numbers of women must be recruited. Figure 3 shows the percentage of women of the total recruited. As demonstrated by the figure, an increasing percentage of those enlisting are women. Over the period, there was an 84.5 percent increase of women recruits. Since FY 77 there has been a continual increase of women recruits. This corresponds to the Navy increasing opportunities available to women in non-traditional roles in an effort to increase the utilization of women.<sup>17</sup> The women entering the Navy, were broken into white and nonwhite groups to further analyze the data. Figure 4 represents the percentage of female accessions that the Navy's recruits (FIG. 2), this trend was also maintained by nonwhite females.

### D. EDUCATIONAL LEVEL

The next variable studied was the educational level attained by the Navy recruits. Table III shows the percentage of enlistees by year, whose highest level of education falls into one of the four broad categories. Again a person with a GED equivalency is not considered a high school graduate, because she did not complete the twelfth year of education. As illustrated by the data in Table III, the percentage of

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<sup>17</sup> Binkin and Bach, Op. Cit., pp. 25-26.

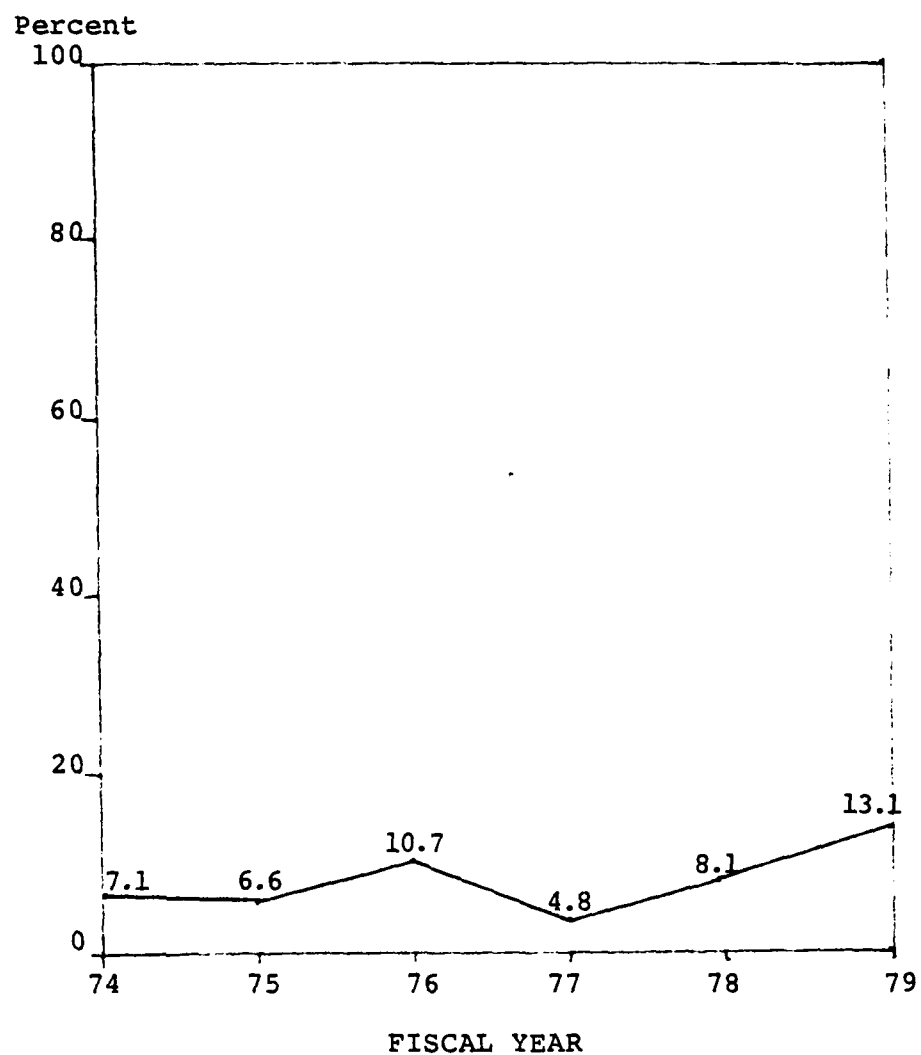


FIGURE 3. FEMALE NAVY ACCESSIONS IN PERCENT OF ALL NAVY ACCESSIONS

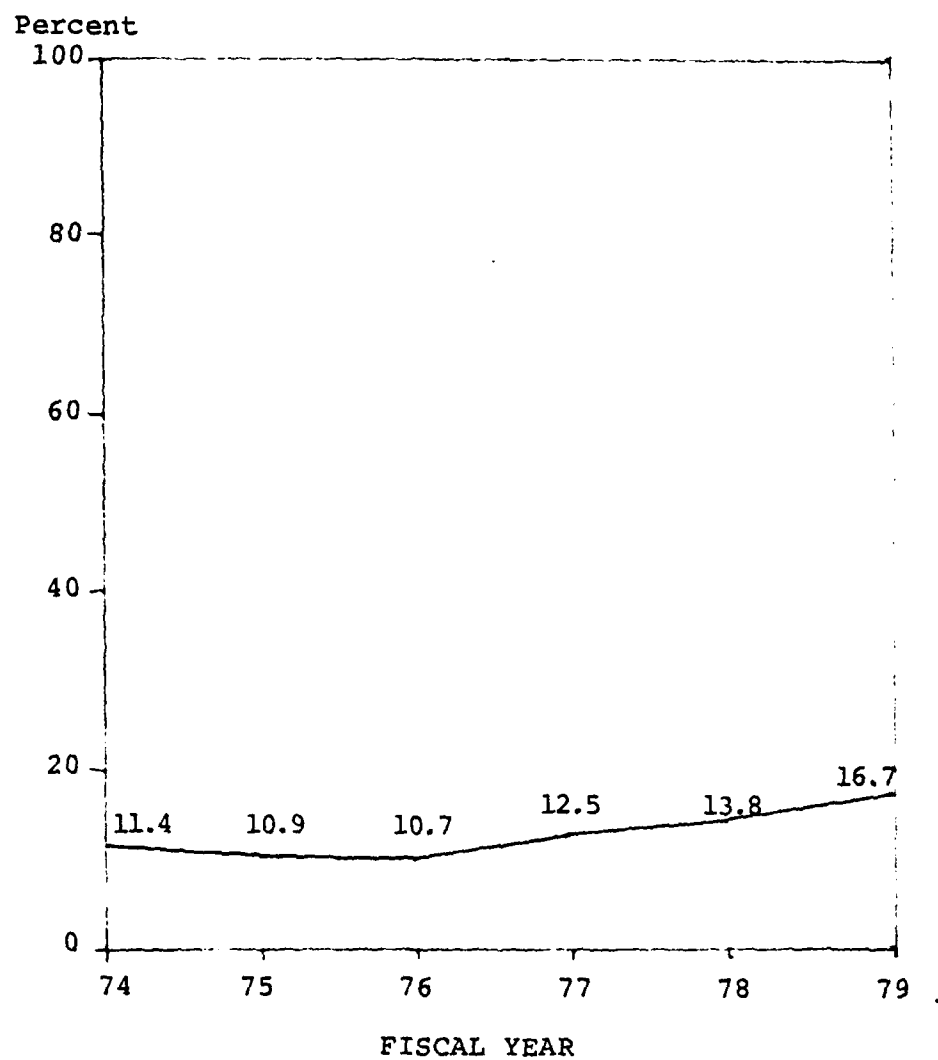


FIGURE 4. NONWHITE FEMALE NAVY ACCESSIONS IN PERCENT OF ALL FEMALE NAVY ACCESSIONS

those with less than a high school diploma has decreased over the period. The most dramatic change in percentages of those with at least a high school diploma occurred from FY 76 to FY 77. In FY 77 there was a great increase in the percentage of high school graduates enlisting, 9.3 percent. This corresponds with a sharp decline in those enlisting with some college education. The decrease of 7.1 percent of enlistees with some college is by comparison with FY 76, a 82.6 percent reduction between the two years.

TABLE III

Educational Level of Navy Accessions, by Year, in Percent						
Level of Education	FY74	FY75	FY76	FY77	FY78	FY79
Elementary	0.6	0.4	0.2	0.4	0.5	0.6
Some High School	29.4	24.8	23.2	24.0	24.9	22.0
High School Graduate	62.3	66.2	67.0	73.2	65.5	69.6
Some College	7.0	7.8	8.6	1.5	8.0	6.9
College Graduate	0.7	0.8	1.0	0.9	1.1	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

To further analyze the educational level of the Navy's accessions, they were categorized as either high school graduates or non-high school graduates. This grouping facilitated comparing educational attainment between races, the sexes, and geographic regions. Figure 5 shows the percentage of non-high school graduates of all accessions over the period.

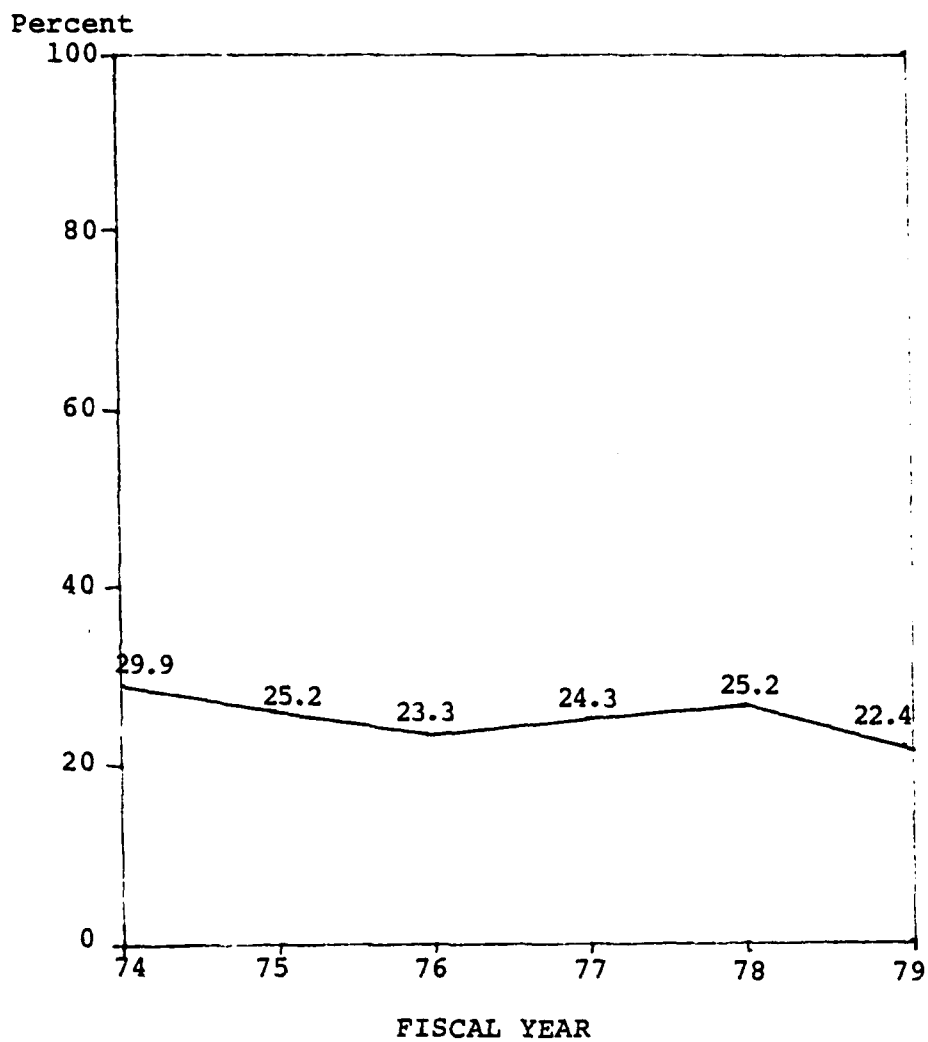


FIGURE 5. NON HIGH SCHOOL GRADUATE NAVY  
ACCESSIONS IN PERCENT

The decline in the percentage of all Navy recruits who are not high school graduates is shown in Figure 5 and implied in Table II. There was a 25.1 percent reduction in non-high school graduate accessions over the period.

Comparisons of the two racial groups by their educational attainment is shown in Figure 6. Although both groups had an increase in the percentage of high school graduates, the nonwhite group's gain was much greater, 25.7 to 7.7 percent respectively. This also represents a decrease in non-high school graduates, with a smaller group of nonwhite non-high school graduates being recruited.

The composition of the male and female cohort by educational level is displayed in Figure 7. As can be seen, the male cohort of high school graduates increased by 12.5 percent over the period. The female cohort on the hand, decreased from 99.7 to 85.3 percent over the period, a decline of 14.4 percent.

The geographic distribution of high school graduates was also explored. Figure 8 shows the percentage of high school graduates coming from each region over the period. The Northeast showed a 24.6 percent increase over the time frame studied and was the greatest advance. The only region to show a decline, was the West with a 5.2 percent loss.

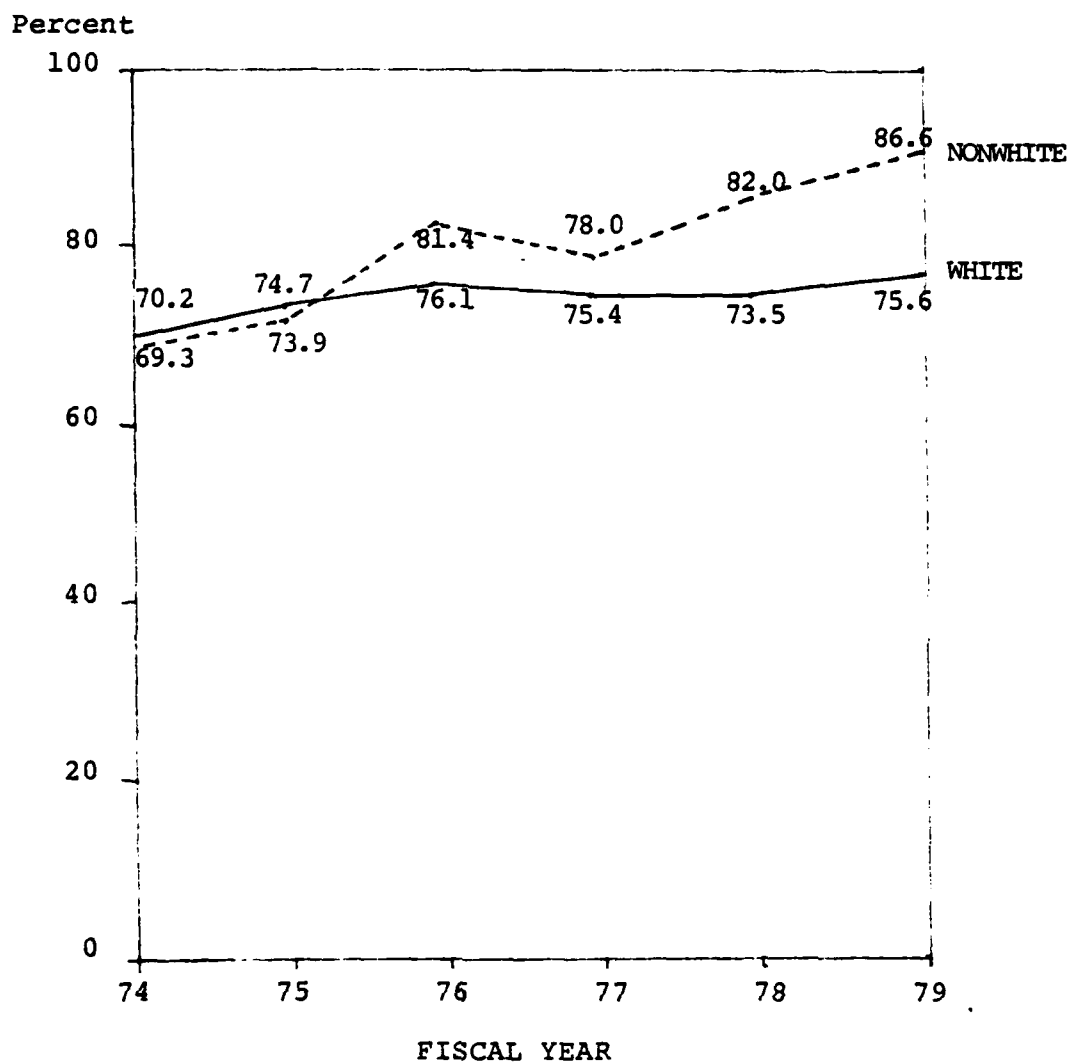


FIGURE 6. HIGH SCHOOL GRADUATE NAVY ACCESSIONS, BY RACE, IN PERCENT

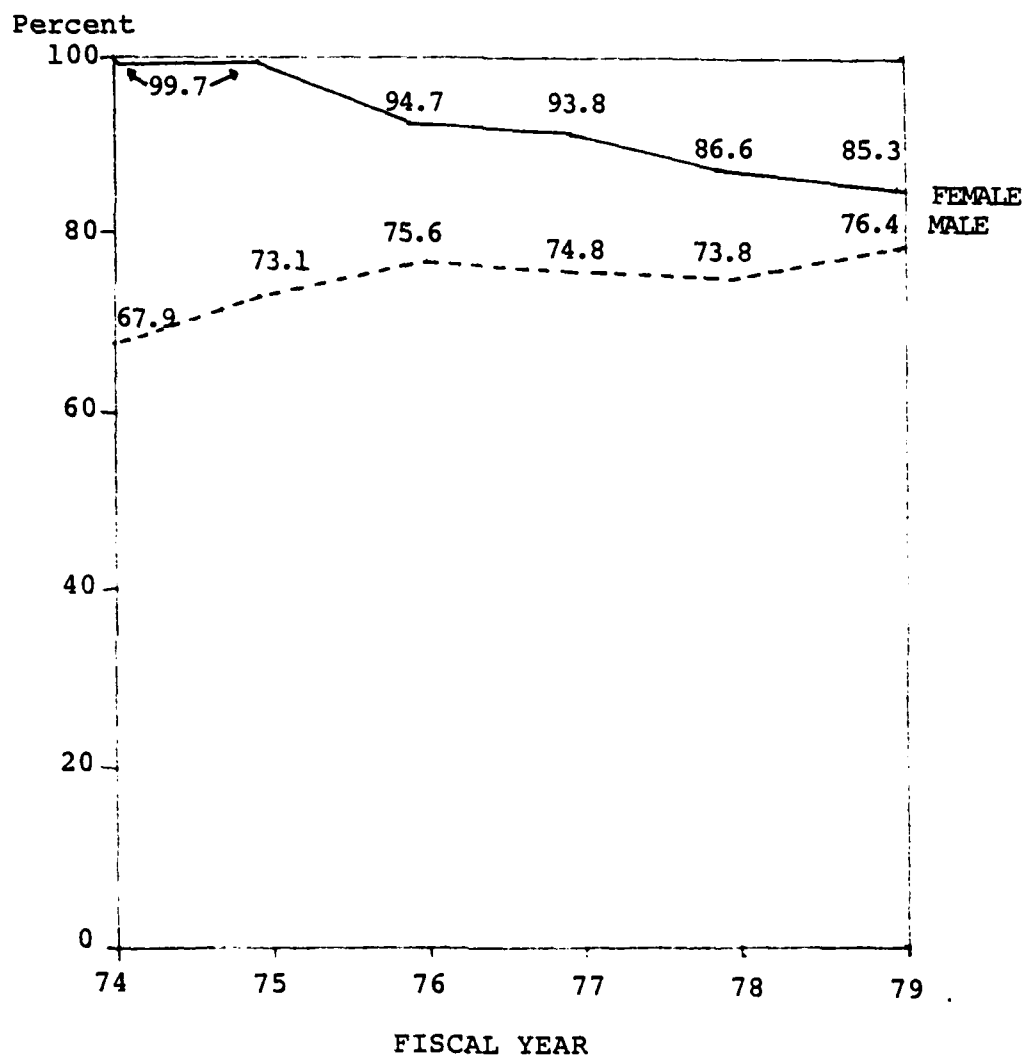


FIGURE 7. HIGH SCHOOL GRADUATE NAVY ACCESSIONS,  
BY SEX, IN PERCENT



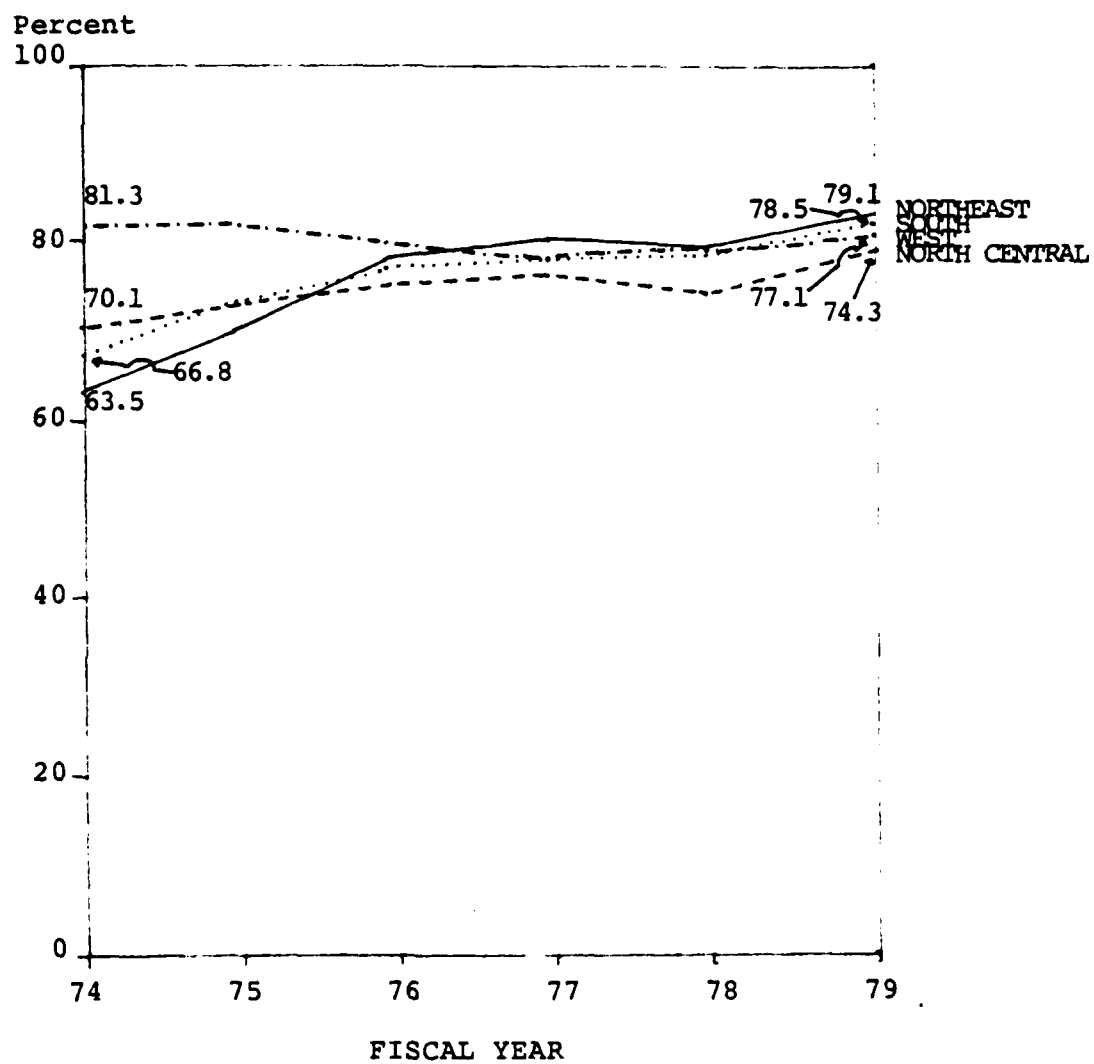


FIGURE 8. HIGH SCHOOL GRADUATE NAVY ACCESSIONS, BY REGION, IN PERCENT

#### E. MENTAL APTITUDE

In addition to educational attainment, another indication of the quality of recruits is mental aptitude as measured by the AFQT mental group classification system. Using this system, the Navy determines those who they consider eligible for technical training beyond recruit training. Those who fall into mental groups I through IIIa, the Navy considers to have sufficient ability to finish additional training. This group is composed of those who are in the upper 50 percentile on the AFQT. These tests are supposed to be normed to the entire U.S. population. The data presented are not adjusted for any possible misnorming of the various tests used between FY 74 and FY 79.

Figure 9 shows the percentage of recruits that were classified in the upper mental groups. Over the period studied, there was a 25.4 percent increase in those enlistees who were in mental groups I through IIIa. Additionally, the classification by mental group was broken down by racial group. Figure 10 represents those in the upper mental groups who are white and nonwhite. Although both racial groups increased their percentage in the upper mental group over the period, the 35.8 percent increase by the nonwhite group was twice as large as the 17.3 percent increase by the whites.

Further classification by sex revealed another trend. While both males and females increased the percentage of their cohort in the upper mental groups, the females had a

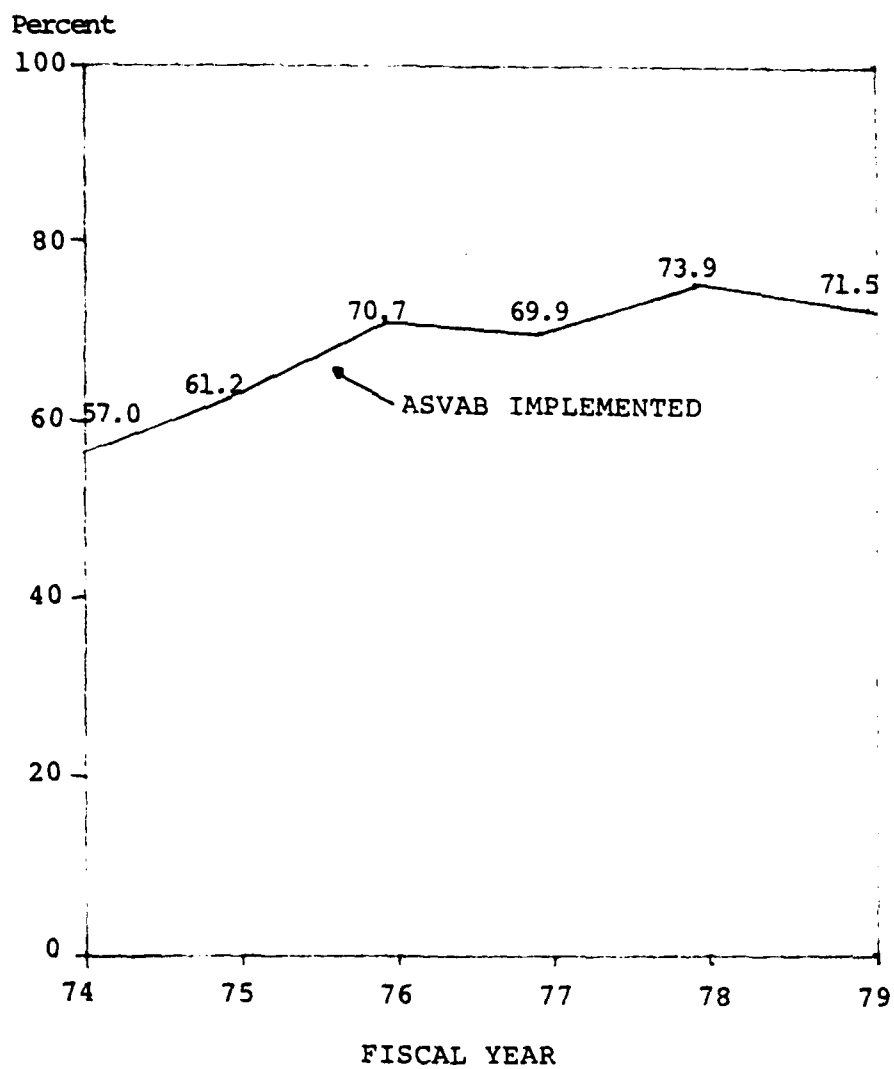


FIGURE 9. MENTAL GROUP I THROUGH IIIa NAVY  
ACCESSIONS IN PERCENT

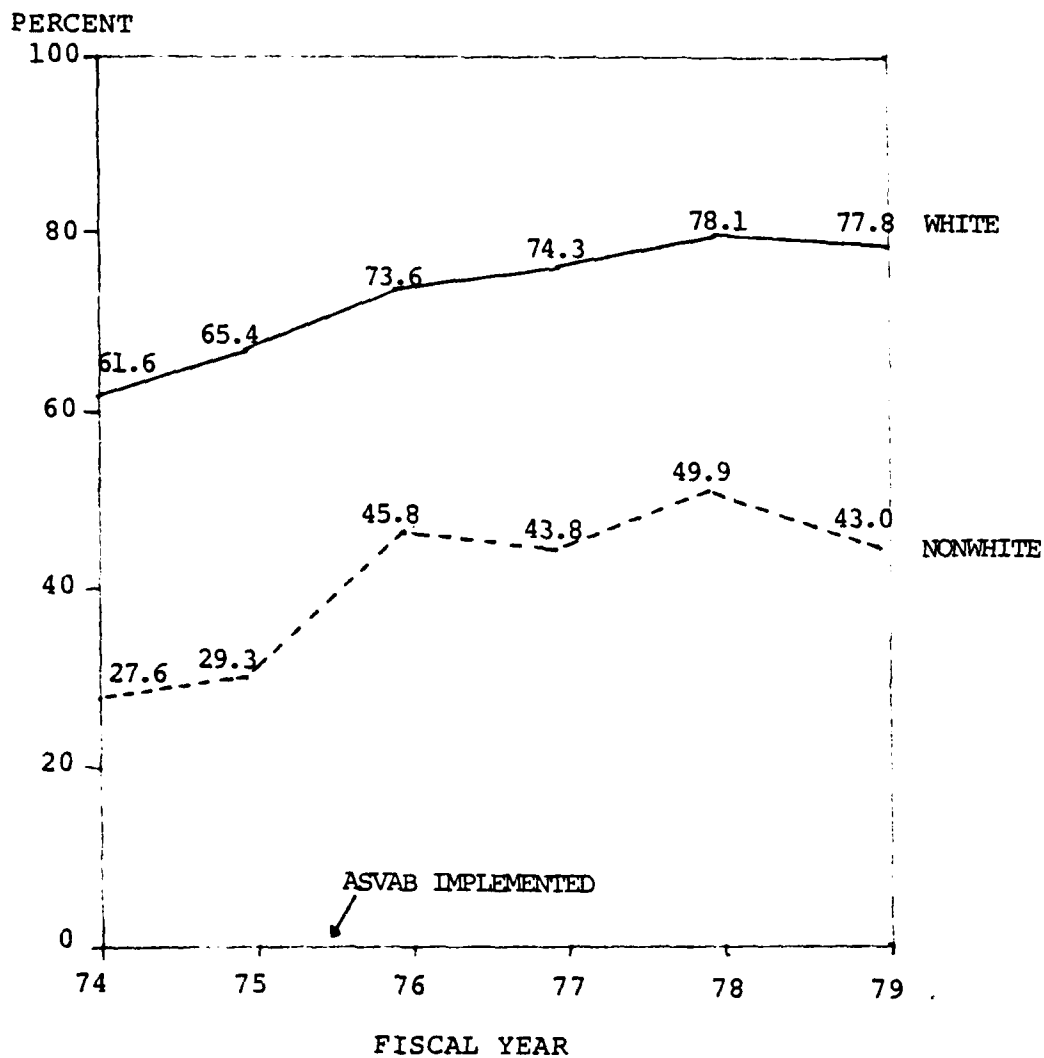


FIGURE 10. MENTAL GROUP I THROUGH IIIa NAVY  
ACCESSIONS, BY RACE, IN PERCENT

dramatic increase. From 8.9 percent in FY 74 to 79.5 percent in FY 79, almost an 800 percent increase over the period. Figure 11 graphically displays these trends. A possible explanation of the dramatic increase in those females in the upper mental groups, particularly from FY 74 to FY 77, is that the classification tests may have been sexually biased initially. Between FY 74 and FY 77 the Navy used three different groups of tests to determine AFQT mental groups. At the start of this period the Short Basic Test Battery (BTB) was used. These tests were replaced in July 1974 with a new group of tests, BTB-8. At the end of 1975, DOD ordered the military services to use a common test battery, the Armed Services Vocational Aptitude Battery (ASVAB). The changes in the tests used and the possibility of sexual bias, however do not seem sufficient to reasonably explain such a large change in the data. An additional reason for this extreme change is the possibility of coding error or improper data recording. This explanation is probably the most reasonable. This study has no way of determining which explanation is true.

As discussed earlier, the Navy uses a combination of educational attainment and mental group, to report who is qualified for technical training. Table IV shows the percentage of the yearly cohort that is in each of the four classifications, A to D. It should be remembered that groups A and B are those in the upper mental groups (I-IIIa), and that A and C are high school graduates while B and D are not graduates.

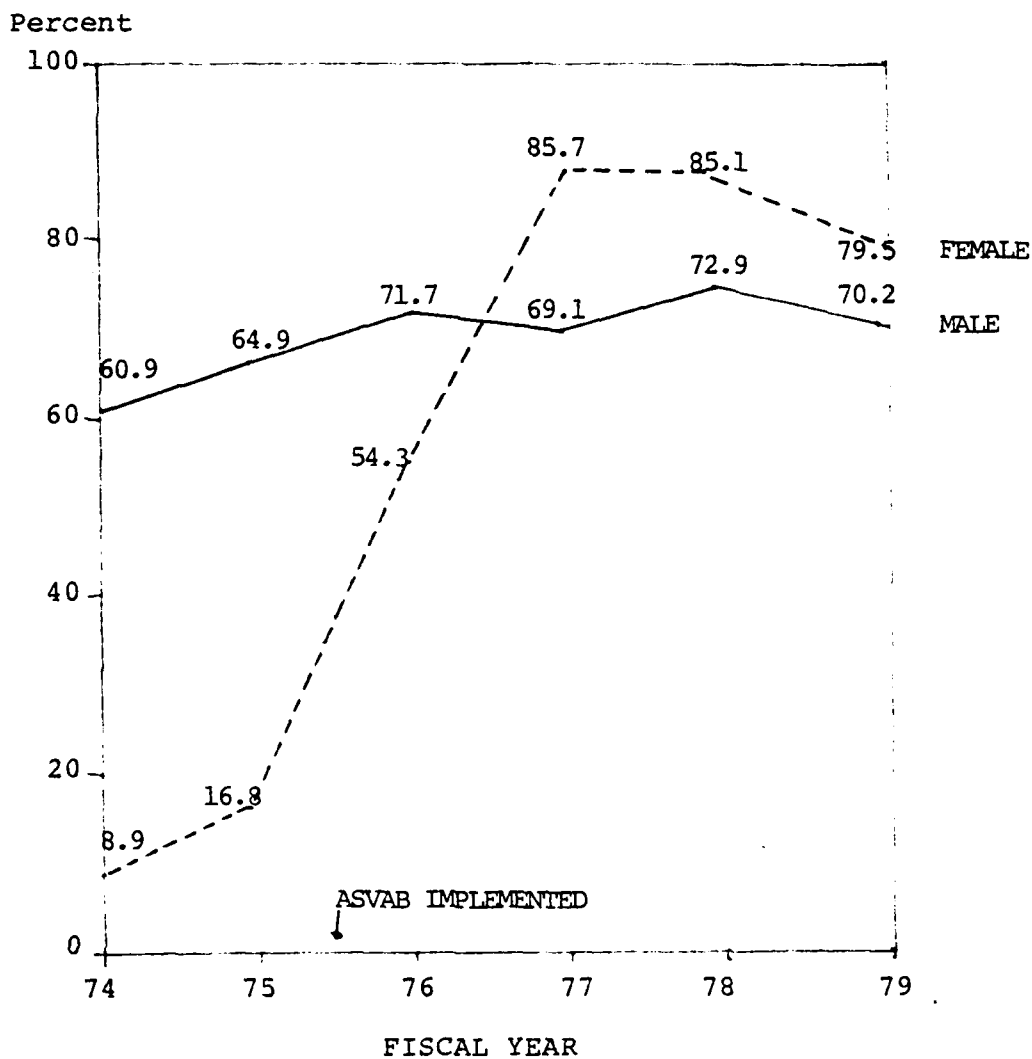


FIGURE 11. MENTAL GROUP I THROUGH IIIa NAVY  
ACCESSIONS, BY SEX, IN PERCENT

Perhaps this measure is the best in terms of overall quality of the accessions. As a combination of the level of education and mental aptitude it is used as a predictor of an individual's chances of surviving technical training and adjustment to the Navy life. Those in group A are predicted to have the highest chances. The increase in group A over the period was 22.2 percent, while group D decreased by 75.3 percent.

TABLE IV

Navy Accessions by Education and School Eligibility, by Year, in Percent

Category	FY74	FY75	FY76	FY77	FY78	FY79
A	44.2	49.5	55.3	54.7	54.5	54.0
B	24.8	24.5	21.3	20.9	20.3	23.7
C	12.8	12.0	15.3	15.2	19.4	17.8
D	18.2	14.0	8.1	9.2	5.8	4.5
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

F. FAMILY INCOME

In addition to the individual's personal characteristics previously discussed, the individual enlistee's family income was studied. This was done to determine a trend in the economic status of the Navy's recruits. It is assumed that families with high incomes live in higher income areas than those with lower incomes. The median family income of a ZIP code area was used as the indicator of the economic status of the area. A ZIP code defines a relatively small and homogeneous area in

terms of the resident population.<sup>18</sup> As a reminder, the data used in this study are the 1978 median family income of each ZIP code area applied to the accessions of each year from FY 74 to FY 79. Although this limits the ability to determine a trend with perfect accuracy, the trend that does emerge should be indicative of the actual trend. The affluence of a community or ZIP code area over a seven year time horizon is assumed to be fairly stable. An advantage to using only 1978 income data is that it eliminates the need to adjust each year's income figures to a common base for comparison.

Using the statistical techniques described in Chapter III, the average median family income of various subsets of each entering cohort was computed. Table V shows the median family incomes of Navy accessions by region for each year of the study.

TABLE V

Average Median Family Income in 1978  
Dollars of Navy Accessions by Region, by Year

Region	FY74	FY75	FY76	FY77	FY78	FY79
Northeast	17359	17436	17626	17487	17479	17434
North Central	18253	18301	18456	18351	18229	18297
South	16039	16152	16320	16304	16264	16145
West	18834	18873	18943	18825	18793	18769
All Regions	17352	17407	17593	19491	17406	17300

<sup>18</sup> Cooper, Op. Cit., 1977. pp. 221-225.



As the Table reveals, there was very little change in the income within each region over the period. These changes indicate that Navy enlistees are coming from different ZIP code areas within the region. The greatest changes were among the regions themselves. All regions, except the South, had family incomes greater than the average median family income of all Navy accessions for each year. The West was highest, followed by the North Central Region and the Northeast, which was only slightly higher than the average. The South, on the other hand, was consistently about \$1200 below the national average of the Navy recruits. The South also had the greatest percentage of change between the lowest and highest values during the period, 1.8 percent.

The family income within each region by race was also computed. It is tabulated in Table VI.

TABLE VI

Average Median Family Income in 1978 Dollars of Navy Accessions  
by Race, by Region, by Year

Region	Race	FY74	FY75	FY76	FY77	FY78	FY79
Northeast							
	White	17725	17823	17979	17941	17914	17953
	Nonwhite	15241	15453	16345	15562	15843	15760
North Central							
	White	18439	18465	18619	18580	18393	18457
	Nonwhite	16906	16941	17085	17081	17202	17319
South							
	White	16318	16373	16514	16486	16478	16392
	Nonwhite	14934	15096	15312	15548	15456	15455
West							
	White	19102	19105	19217	19116	19028	19011
	Nonwhite	16710	17198	17448	17429	17355	17448

The interesting feature of the table is that the white's income was greater than the nonwhite's in every region. However, over the period, the nonwhites increased their income at a rate about three times faster than the whites. The increase was about \$600 for all nonwhites compared to about \$200 for all whites.

The other computation of family income was based on sex within each region. Table VII shows that in almost all cases, the family income of female accessions was greater than the male's family. This would imply that more female accessions come from areas of high income than do the male accessions.

TABLE VII

Average Median Family Income in 1978 Dollars of Navy  
Accessions, by Sex, by Region, by Year

Region	Sex	FY74	FY75	FY76	FY77	FY78	FY79
Northeast	Male	17350	17418	17626	17490	17480	17419
	Female	17484	17836	17655	17438	17469	17548
North Central	Male	18243	18300	18457	18348	18187	18294
	Female	18396	18330	18408	18376	18697	18310
South	Male	16023	16137	16317	16298	16250	16132
	Female	16268	16402	16370	16446	16418	16241
West	Male	18825	18882	18943	18810	18781	18729
	Female	18964	18771	18943	19259	18916	19032

#### G. OTHER CHARACTERISTICS

Other characteristics of the enlistees studied were age, marital status, and prior military service. Figure 12 shows both the mean and median age of all the recruits by year. As the graph shows, the age of the entrants is increasing over the period. Throughout the period the modal age was age 18.

The marital status of the enlistees at time of entry was determined, but is not considered valid due to the high percentage of missing data. This may have been the result of improper coding or inaccurate recoding of data. The data for FY 74 and FY 75 had no missing cases, but the other years had 60 percent or more missing.

The last variable studied was prior service, to determine the percentage of recruits that have not had prior military service. Recruits with prior military service are those who were discharged from the military and then enlisted or those who joined the Navy from a reserve or inactive reserve status. Figure 13, show the percentage of non prior service (NPS) accessions is decreasing over the period. This means a greater percentage of people with prior military service entered the Navy over the period.

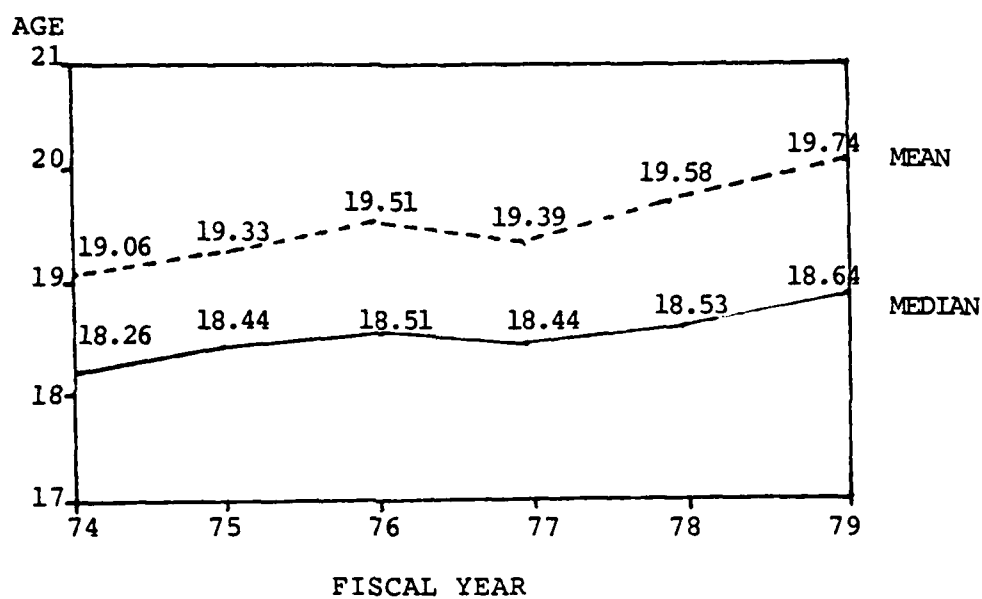


FIGURE 12. MEAN AND MEDIAN AGE OF NAVY  
ACCESSIONS

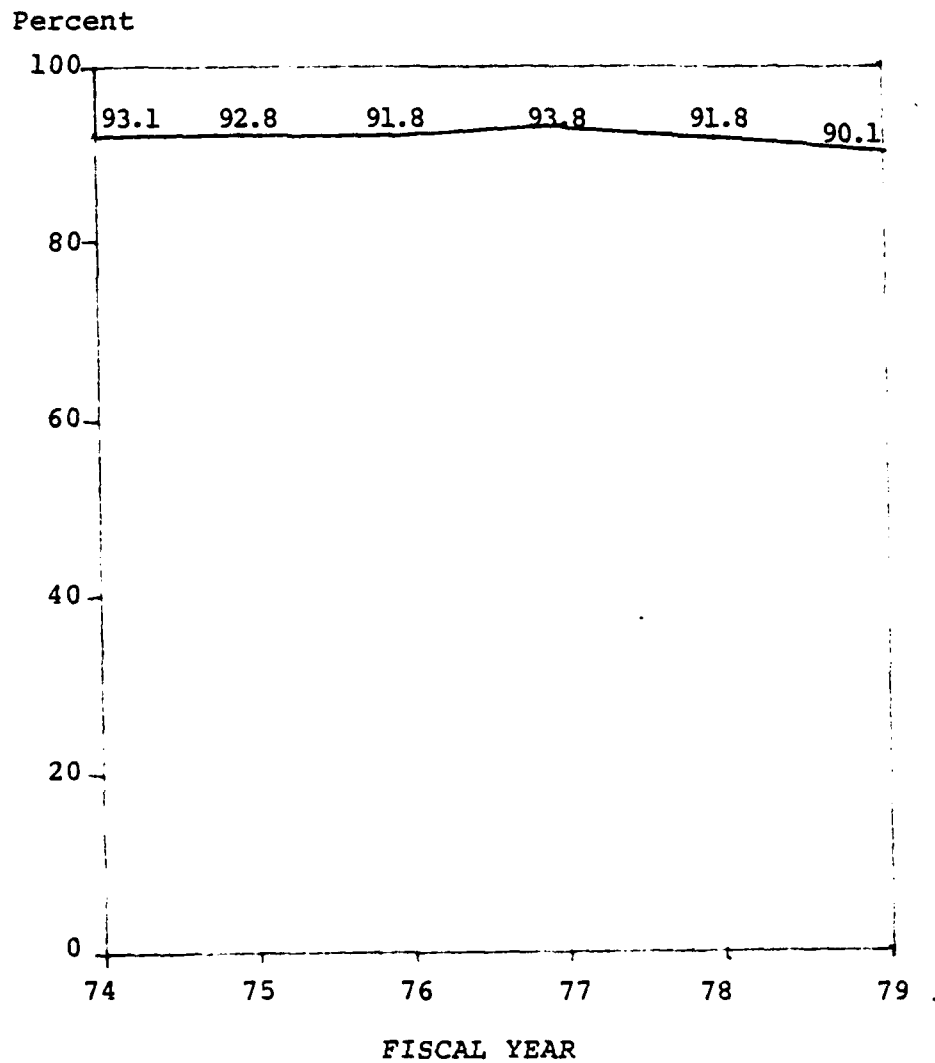


FIGURE 13. NON PRIOR SERVICE NAVY ACCESSIONS,  
IN PERCENT

## V. REPRESENTATIVENESS

The relevant population for the question of representativeness is the noninstitutionalized population ages 17 through 24 of all races and both sexes. This is the population group most generally accepted for military service in the Navy.

The data for the U.S. population were taken from the U.S. Bureau of Census Current Population Reports and the 1978 and 1979 editions of the U.S. Statistical Abstract. Because some of the data are grouped into various age categories which encompass all or some of the ages in the Navy cohorts, it was necessary to adjust the data using the weighted average technique.

### A. GEOGRAPHIC

The first comparison was based on the geographic distribution of the two groups. The mores, cultural background and attitudes often vary from region to region. For this reason, a Navy whose recruit's geographic composition is proportionate to the relevant U.S. population, will tend to hold mores, cultural background, and attitudes representative of the nation. Secondly, regional comparisons will indicate if one region is providing more than its share of enlistees. Table VIII shows the regional distribution of the Navy accessions and the U.S. population. The greatest difference between the two groups is in the South, where there was a 12.6 percent

under representation in the Navy based on the relevant population. All other regions were over represented in the Navy. The 18-20 age group represents 62.6 percent of the 124,090 Navy recruits in FY 77.

TABLE VIII

U.S. Population (18-20) and Navy Accessions (18-20),  
by Region in 1977, in Percent

Region	U.S. Population <sup>a</sup>	Navy	Percent Different
Northeast	21.5	23.3	+8.4
North Central	27.4	28.8	+5.1
South	32.5	28.4	-12.6
West	18.6	19.5	+4.8
Total	100.0	100.0	

<sup>a</sup>Source: Statistical Abstract of the United States: 1979

#### B. RACE

Racial composition of the two cohorts was next examined. The range of ages used to determine the sample use for comparison was 17 to 24. Through the use of the weighted average technique the results shown in Table IX were computed.

TABLE IX

U.S. Population (17-24) and Navy Accessions (17-24)  
by Race, in 1977, in Percent

Race	U.S. Population <sup>a</sup>	Navy
White	85.21	85.03
Nonwhite	14.79	14.97
Total	100.00	100.00

<sup>a</sup>Source: Statistical Abstract of the United States: 1978

Additionally, comparisons of the racial composition within the census regions to the racial composition of enlistees from each census region were made. The data are shown in Table X. This table shows the racial breakdown within each region of both the relevant U.S. population and the Navy accessions. The Northeast and North Central are both slightly under representative of the white population within each region. Both regions are over represented by nonwhites in the Navy. The greatest discrepancy being 15.2 percent more nonwhites from the Northeast in the Navy than in the regional population. The South on the other hand has 8.0 percent fewer nonwhites enlisting in the Navy than is representative of the nonwhite civilian population. The West's recruits are also under representative of the nonwhite population of the West, by 5.2 percent of the relevant population. White representation of the South and of the West is larger than the relevant population by 2.2 and 0.8 percent respectively.

Table XI shows the regional distribution of each racial group both in the Navy and in the U.S. Again, this is limited to persons 18 to 24 years of age. The whites are over represented in all regions except in the South, where they are under represented. The nonwhite group was perfectly numerically representative in the West. Navy nonwhites from the South were less than representative (14.6 percent) of the South's civilian nonwhite population. The South was the only region that was providing less than its share of both white



and nonwhite recruits. Both the Northeast and the North Central regions were over represented based on the data in Table XI. Although the West was over represented by whites, it was fairly represented by nonwhites.

TABLE X

U.S. Population (18-24) and Navy Accessions (18-24)  
by Region and by Race, in 1977, in Percent

Region	Race	U.S. Population <sup>a</sup>	Navy	Percent Different
Northeast	White	89.5	87.9	-1.8
	Nonwhite	<u>10.5</u>	<u>12.1</u>	+15.2
	Total	100.0	100.0	
North Central	White	89.3	88.5	-0.9
	Nonwhite	<u>10.7</u>	<u>11.5</u>	+7.5
	Total	100.0	100.0	
South	White	78.8	80.5	+2.2
	Nonwhite	<u>21.2</u>	<u>19.5</u>	-8.0
	Total	100.0	100.0	
West	White	86.5	87.2	+0.8
	Nonwhite	<u>13.5</u>	<u>12.8</u>	-5.2
	Total	100.0	100.0	

<sup>a</sup>Source: U.S. Bureau of the Census, Current Population Reports,  
Series P-25

TABLE XI

U.S. Population (18-24) and Navy Accessions (18-24)  
by Region and by Race, in 1977, in Percent

Region	U.S. Population <sup>a</sup>	Navy	Percent Different
White			
Northeast	23.0	23.6	+2.6
North Central	28.1	29.1	+3.6
South	29.9	27.6	-7.7
West	19.0	19.7	+3.7
Total	100.0	100.0	
Nonwhite			
Northeast	15.8	19.6	+5.1
North Central	19.7	22.8	+15.7
South	47.1	40.2	-14.6
West	17.4	17.4	0
Total	100.0	100.0	

<sup>a</sup>Source: U.S. Bureau of the Census, Current Population Reports, Series P-25

#### C. SEX

As Table XII shows, half of the 18-24 year old population is male and 94.9 percent of the Navy's accessions were male. Although policy changes and Navy goals call for increased utilization of women, it is still a predominately male organization. This distribution was used to generate other estimates based on sex.

TABLE XII

U.S. Population (18-24) and Navy Accessions (18-24)  
by Sex, in 1977, in Percent

Sex	U.S. Population <sup>a</sup>	Navy Accessions
Male	50.0	94.9
Female	50.0	5.1
Total	100.0	100.0

<sup>a</sup>Source: Statistical Abstract of the United States: 1978

The male and female distributions within the white and nonwhite groups were non equal. Table XIII displays the data for the white and nonwhite group of the 18-24 year old U.S. population by sex.

TABLE XIII

U.S. Population (18-24) and Navy Accessions (18-24)  
by Race and by Sex, in 1977, in Percent

Sex	U.S. Population <sup>a</sup>	Navy Accessions
White		
Male	43.0	81.0
Female	42.5	4.5
Total	85.4	85.5
Nonwhite		
Male	7.0	13.9
Female	7.6	0.6
Total	14.6	14.5

<sup>a</sup>Source: Statistical Abstract of the United States: 1978

Overall the racial composition is almost equal. In order to provide a more meaningful measure of representativeness, it was necessary to estimate the racial and sexual distribution within the Navy for comparison to the observed Navy distribution. The estimate takes the observed male-female distribution within the Navy and applies to it the U.S. racial distribution for 18-24 year olds. The resultant distribution gives us expected enlistment percentages by race times sex categories for the Navy. This distribution is then compared to the actual race times sex list of enlistees from Table XIV.

TABLE XIV

Navy Accessions (18-24) by Race and by Sex in Percent,  
in 1977 and Estimated Percentages

Sex	Navy	Estimated Percentages	Percent Different
White			
Male	81.0	81.0	0
Female	4.5	4.4	+2.3
Total	85.5	85.4	
Nonwhite			
Male	13.9	13.9	0
Female	0.6	0.7	-14.3
Total	14.5	14.6	

Based on these estimates, white males and nonwhite males are properly represented. The female distribution was non representative, the greatest difference being for the nonwhite females, who are under represented by an estimated 16.7 percent. On the other hand, white females were over represented by 2.3 percent, based on the estimated distribution.

#### D. EDUCATIONAL LEVEL

Table XV compares the percentages of high school graduates of the 18 year old population and the 18 year old high school graduates in the Navy cohort. Eighteen year olds make up 36.1 percent of the entire FY 77 Navy accessions and is the model age of enlistees. The median age of FY 77 enlistees was 18.3 years. Generally, most high school students graduate when they are 18, so for comparison purposes, these data for this age are readily available. As the data indicate, the Navy was able to attract 4.4 percent more high school graduates than is representative of the population. U.S. Bureau of the Census data indicate that in 1977, 26.3 percent of the 73.7 eighteen year olds who were high school graduates went on to college. This in effect reduced the relevant high school population that might consider enlisting in the Navy to 54.3 percent of all 18 year old high school graduates in 1977. The nonwhite high school graduate group in the Navy was 10.3 percent smaller than the U.S. population while the white high school graduate group was 1.5 percent larger. The percentage of male and female graduates is shown to indicate the large potential source of manpower that the females represent.

TABLE XV

18 year Old High School Graduates in the U.S. Population and Navy Accessions,  
in 1977, in Percent, by Race and Sex

	U.S. Population <sup>a</sup>	Navy	Percent Different
Race			
White	64.4	69.3	+7.6
Nonwhite	9.3	8.8	-5.4
Total	<u>73.7</u>	<u>78.1</u>	+6.0
Sex			
Male	35.4	71.0	+100.6
Female	38.3	7.1	-81.5
Total	<u>73.7</u>	<u>78.1</u>	+6.0

<sup>a</sup>Source: Statistical Abstract of the United States: 1978

#### E. FAMILY INCOME

The last area of comparison is family income. Because the Navy data were in 1978 dollars and the latest CPS data were in 1977 dollars, it was necessary to adjust one for comparison. The 1978 dollars were deflated to 1977 dollars using the consumer price index (CPI). In this case the deflated value was .9235, which was obtained from the 1979 Economic Report of the President. The population data came from the CPS series P-60 issued in March, 1979, entitled Money Income in 1977 of Families and Persons in the United States.

Table XVI shows the family income data. Only data relevant to families were used to represent the relevant population of the U.S. The most striking thing about this table is the big differences between the nonwhite population and the Navy

accessions' families. The slight difference between the white groups is also presented. In almost all regions, the white Navy recruits came from areas between 3.7 and 0.4 percent less affluence than the median age of the area. The exception being the West, where the recruits came from areas where the family income was 3.9 percent higher than the regional mean.

TABLE XVI

Median Family Income of U.S. and Navy Accessions'  
Families in 1977, in 1978 Dollars, by Region, by Race

Region	Race	U.S. Population <sup>a</sup>	Navy	Percent Different
Northeast	White	17200	16569	-3.7
	Nonwhite	9580	14372	+50.0
North Central	White	17231	17159	-0.4
	Nonwhite	11516	15774	+37.0
South	White	15721	15225	-3.2
	Nonwhite	9389	14359	+52.9
West	White	16985	17654	+3.9
	Nonwhite	11480	16096	+40.2

<sup>a</sup>Source: U.S. Bureau of the Census, Current Population Series, P-60

Nonwhite enlistees came from localities where the median family income was substantially higher than the nonwhite regional median family income. The region with the lowest percentage difference was the North Central, 37 percent, and the highest was the South with a 52.9 percent difference.

The implications of these comparisons are limited by the nature of the data. On one hand, the values for the U.S. population are indicative of the actual median family income, where on the other hand, the Navy values represent the median family income of an area. Furthermore, although the area, a ZIP code, is small, unless it is totally black or white, it may provide misleading values. As implied by the CPS data, nonwhites earn less income than whites. It is highly probable that in racially mixed neighborhoods, the majority of the nonwhite incomes are less than the median income of the area. If this is the case, then nonwhite family incomes would be artificially inflated to the median income of the area. However, this inflation would not be sufficient to cause the nonwhite Navy accessions to have family incomes 37 to 53 percent greater than all other nonwhite families. The only implication is that the Navy nonwhite accessions represent a large portion of affluent nonwhites within the U.S. population.



## VI. SUMMARY AND CONCLUSIONS

This thesis was concerned with the socioeconomic trends within the Navy between fiscal years 1974 and 1979 and its representativeness in fiscal year 1977. The first part of the study provided a historical context of representativeness as it evolved through its many stages to the present time, when the All-Volunteer Force was instituted. The concept of the individual's right and obligation to serve in the defense of his country has been a major principle of U.S. military service and in the foundation of a policy of representativeness in the military.

Next, the study examined individual and socioeconomic characteristics of all Navy accessions between FY 74 and FY 79. These characteristics of the enlistees for each year were compared to those of the other years. From these comparisons trends within the entering cohorts were detected.

Regionally, the percentage of Navy enlistees from the South increased from 30.9 in FY 74 to 35.2 in FY 79. This is about a 14 percent increase across the period. It is interesting that about one half of the nonwhites who enter the Navy originate from the South.

Racial composition was inspected, and it was found that an increasing percentage of nonwhite people had entered the Navy from FY 74 to FY 79. The aggregate increase was 1.12

percent annually from 12.1 in FY 74 to 17.7 in FY 79. This is a 9.2 percent annual growth rate in nonwhite enlistees.

The sex of Navy recruits revealed a growth in the number of females entering. Females were 7.1 percent of all Navy accessions in FY 74; white women represented 13.1 percent of the recruits in FY 79. This is an 84.5 percent increase during the six years studied. Both nonwhite and white females increased, in terms of percentage of all recruits.

Regarding the traditional indicators of quality, educational level and mental aptitude, both increased between FY 74 and FY 79 in terms of the percentage of high quality recruits. High school graduates made up 70.1 percent of the entering cohort in FY 74 and represented 77.6 percent of the recruits in FY 79. Those in the upper half of the mental group were only 57 percent of all recruits in FY 74. By FY 79 this group was 71.5 percent of all entrants. This is a 25.4 percent increase during that period. These data are not adjusted for any possible misnorming of the various tests used during the period.

For the Navy enlistees, the median family incomes over the period, in 1978 dollars remained stable for the white group. Although the nonwhite group had lower family incomes, nonwhite incomes increased over the period at a rate about three times faster than the white families. In both groups, the South had the lowest family incomes. By sex, the females came from families with higher incomes than their male counterparts.

Other characteristics studied included age at enlistment. Between FY 74 and FY 79 the average age of the recruits had increased 19.06 years to 19.74 years, or about 9 months.

Lastly, this study looked at representativeness of the FY 77 cohort in terms of the relevant civilian population. For comparison purposes it was often necessary to take various age groups of the Navy's accessions because of limitations in available Census Bureau data. In these cases, the Navy data were adjusted so that various percentages summed to 100.

Regionally the South was under represented in terms of the percent of Navy recruits it provided and its percentage of the total relevant population. The nonwhite participation rate is about 8 percent less than the nonwhite population of the South in 1977. This is interesting because about half of the nonwhite Navy recruits come from the South.

The aggregate racial composition of the Navy in 1977 is almost exactly representative of the relevant population. The percentage of difference between the two is less than one percent. By regions, the white Navy accessions are representative, however, this is not the case for the non-white group. The South and West are both under represented by eight and 5.2 percent respectively, while the Northeast and North Central regions are over represented, 15 and 7.5 percent.

Because the males vastly outnumber females in the Navy, it was necessary to remove the influence of the male: female ratio in the Navy before a meaningful comparison could be made. After this was done, the male representation of both whites and nonwhite was a mirror image of the society. The female percentages showed that white females are overrepresented by 2.3 percent and nonwhite females underrepresented by 14.3 percent in 1977.

The comparison of percentage of 18 year olds in the U.S. population to 18 year olds entering the Navy that are high school graduates revealed that the Navy received proportionately more in 1977. Of the society's 18 year olds, 73.7 percent were high school graduates, while 78.1 percent of all the Navy's 18 year olds were high school graduates. Nonwhites entering the Navy are less educated than their civilian counterparts, in terms of percentage of high school graduates.

The last comparison was made between family incomes. Although the data available have limitations, the comparisons are considered valid indicators. The white median family incomes of the civilian society and of the Navy accessions were almost equal, with the income of Navy enlistees being slightly less, by about 3.5 percent. The nonwhite median family incomes varied greatly between the U.S. population and the Navy recruits. The nonwhite Navy enlistees were far more affluent, by about 50 percent, than their civilian counterparts.

Overall, during the six years studied, the quality of the Navy's accessions appears to have increased. Also, the utilization of nonwhites and women has increased. With the exception of sex, the Navy was representative of the relevant civilian society in 1977.

## BIBLIOGRAPHY

- Backman, J.G., Blair, J.D., and Segal, D.R., The All-Volunteer Force, Ann Arbor: The University of Michigan Press, 1977.
- Binkin, M., and Bach, S.J., Women and the Military, Washington, D.C.: The Brookings Institution, 1977.
- Binkin, M., and Kyriakopoulos, I., Youth or Experience? Manning the Modern Military, Washington, D.C.: The Brookings Institution, 1979.
- Cooper, R.V.L., Military Manpower and the All-Volunteer Force, (R-1450-ARPA), Santa Monica, Ca.: The Rand Corp. September, 1977.
- Cooper, R.V.L., Military Manpower and the All-Volunteer Force, Statement prepared for the Subcommittee on Military Personnel, Armed Services Committee, U.S. House of Representatives, Washington, D.C., 15 February 1978.
- Cooper, R.V.L., (Ed.) Defense Manpower Policy: Presentations from the 1976 Rand Conference on Defense Manpower, (R-2396-ARPA), Santa Monica, Ca.: The Rand Corp., 1979
- Davis, J.W., Jr., and Dolbeare, K.M., Little Groups of Neighbors: The Selective Service System, Chicago: Markham Publishing Co., 1968.
- Hoel, P.G., and Jessen, R.J., Basic Statistics For Business and Economics (2nd ed.), New York: John Wiley and Sons, 1977.
- Hunter, W.C., and Nelson, G.R., The All-Volunteer Force. Has it worked? Will it work?, Paper prepared for the All-Volunteer Force versus Conscription Conference, Hoover Institution on War, Revolution and Peace, Stanford, 13-16 December 1979.
- King, W.R., The All-Volunteer Military: Viewpoints, Issues and Prospects, Paper prepared for the All-Volunteer Force versus Conscription Conference, Hoover Institution on War, Revolution and Peace, Stanford, 13-16 December 1979.
- Liston, R., Greeting: You are Hereby Ordered for Induction . . ., New York: McGraw Hill Book Co., 1970.

Lockman, R.F., Success Chances of Recruits Entering the Navy (SCREEN) (CNS 1086), Arlington, Va.: Center For Naval Analysis, February 1977.

Moskos, C.C., Jr., National Service and the All-Volunteer Force, Statement prepared for the subcommittee on Military Personnel, Armed Services Committee, U.S. House of Representatives, Washington, D.C., 14 February 1979.

Moskos, C.C., Jr., Serving in the Ranks: Citizenship and the All-Volunteer Force, Paper prepared for the All-Volunteer versus Conscription Conference, Hoover Institution on War, Revolution and Peace, Stanford, 13-16 December 1979.

Nie, N.H., and others, Statistical Package for the Social Sciences (2nd ed.), New York: McGraw-Hill, 1975.

U.S. Bureau of the Census, Current Populations Reports, Series P-60, No. 118, "Money Income in 1977 if Families and Persons in the United States," Washington, D.C.: U.S. Government Printing Office, 1978.

U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 721, "Estimates of the Population of the U.S. by Age, Sex, and Race 1970-1977," Washington, D.C.: U.S. Government Printing Office, 1979.

U.S. Bureau of the Census, Statistical Abstract of the United States: 1978 (99th ed.), Washington, D.C.: U.S. Government Printing Office, 1978.

U.S. Bureau of the Census, Statistical Abstract of the United States: 1979 (100th ed.), Washington, D.C.: U.S. Government Printing Office, 1979.

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